

2. Spikelets 2.5–4.0 mm. long; glumes 1.6–2.0 mm. wide, not falcate; style about 1.0 mm. long; stigma about 1.0 mm. long; achene obovoid, 0.6 mm. wide, straight.

(*C. vegetus* Willd.) = *C. Eragrostis* Lam.

Spikelets 10–20 mm. long; glumes 0.8–1.0 mm. wide, falcate; style about 0.5 mm. long; stigmas about 0.5 mm. long; achene linear, 0.25 mm. wide, falcate. . . . . *C. pseudovegetus* Steud.

The accompanying figure further illustrate these specific differences.

Although Torrey cites a specimen from North Carolina, I have been unable to find this specimen and have found no subsequent collection from this state. The range of this species appears to be South Carolina, Georgia, peninsular Florida and the Bahamas, i.e. the southeastern coastal plain and the Bahamas. A list of specimens studied follows:

SOUTH CAROLINA: *Gibbes*, Charleston. GEORGIA: *Pyron and McVaugh*, St. Simon Island. FLORIDA: *Curtiss*, Indian River, 3062, 5238; *Eaton*, Miami River, 302; *Garber*, Miami; *Hitchcock*, Marion County, 2103, 2105, 2106, 385; *Fredholm* 6184; *Harshberger*, Lake Okeechobee; *LeRoy* sine loc.; *Lighthipe*, Duval County; *Lovett* 179; *Moldenke*, Pompano, Jacksonville, 5254; *O'Neill* 5263, 7629, 7460; *Williamson*, Jacksonville; *Donnell-Smith*, Tampa; *McAtee* 1691; *Standley* 12620, 19026; *Francis* 26. BAHAMAS ISLANDS: *Britton and Brace* 485, Southwest Bay.

The range of *C. pseudovegetus* is northern Florida to Texas and north to Kansas, southern Indiana, southern Illinois, Kentucky, Maryland and southern New Jersey. *C. Eragrostis* is confined to Oregon and California in this country. It occurs as a fugitive in the eastern states, France, New Zealand, etc.

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## NOTES ON NEW ENGLAND ALGAE I: CYCLONEXIS AND ACTIDESMIUM<sup>1</sup>

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AMONG the algae there are many species which are considered extremely rare. One of these is *Cyclonexis*, which Stokes (4) found in New Jersey occurring among Sphagnum plants and described in 1886

<sup>1</sup> Contribution from the Laboratories of Cryptogamic Botany and the Farlow Herbarium, Harvard University. No. 166.



on the single species *Cyclonexis annularis*. In this country it was subsequently recorded by Tiffany (5) in 1934 as occurring in a fish hatchery at the west end of Lake Erie.

In Europe the occurrence of the alga has been recorded twice, first in England by Grove (1) in 1920 and later in Germany by Pascher (2). In none of the records are any extensive notes concerning the alga given. The alga is placed in the family Ochromonadaceae of the Chrysophyceae, a family which includes the more commonly found genus *Dinobryon*.



Early in May (1938) Mr. E. W. Thompson, collecting algae in various ponds and streams in the vicinity of Andover, in eastern Massachusetts, found what he immediately decided was *Cyclonexis annularis* Stokes and reported it to the author. Shortly thereafter, the two of us visited the pool in which the alga had been found. This pool, formed by the partial obstruction of a small brook, is about thirty feet across and at most only a few inches deep, rather densely shaded by bushes and trees, and largely filled with several aquatic species of sedges and grasses.

On this second visit we gathered several bottles of material from various parts of the pool, collecting between two and three o'clock in the afternoon. Returning to the laboratory the writer carefully observed the material collected and could find no sign of any plant sug-



gesting *Cyclonexis*, there being found only sterile filaments of an *Oedogonium* sp., filaments of *Tribonema bombycinum*, and a small number of desmids and diatoms.

The following week we again visited the pool, at about the same time of day and gathered as before, from the same parts of the pool, in which there remained very few of the filamentous algae. On examination a few hours later, *Cyclonexis* was found present in rather large numbers, being especially abundant in the collections made by sucking up material from among the dead maple leaves in the bottom of the pool. The writer watched attentively and examined carefully a great many of the ring-shaped colonies (FIG. 1 a, b).

Most of the colonies seen were composed of from eight to twenty cells. The individual cells were 18–20  $\mu$  long and 6–10  $\mu$  in diameter at the widest part. The cells of a colony varied somewhat in diameter, but were very uniform in length. The longer of the two cilia usually extended out from the apex of the cell to a length of 20 to 25  $\mu$ , but was sometimes recurved over the outer surface of the cell (FIG. 2 b), while the shorter cilium was 6–8  $\mu$  long and nearly straight or only slightly curved. Repeated examination failed to show any indication of the spiral nature of the shorter cilium figured by Stokes and others. The plastids seem to be somewhat variable in position although most frequently they occur as two elongate parietal plates against the lateral walls of the cell. Not infrequently one occurs near the larger end of the cell and is then more or less shell- or cup-shaped.

On several occasions while a colony was being observed it was met by a small crustacean or other swimming animal. Almost always the consequences of such an encounter were fragmentation of the *Cyclonexis* colony. Sometimes it merely broke in two, each of the halves then bending together to form smaller colonies (FIG. 3 a, b). Often fragmentation resulted in unequal colonies, one being composed of only two to five cells. Many cases were observed in which single cells broke away from the colony on such occasions (FIG. 2 c, d). Twice colonies were observed to break up completely into their individual cells.

Not only does fragmentation result from chance encounters of this nature, but it also occurs when the drop of water in which the colonies are being examined begins to evaporate. The changes which occur come on very gradually. One first notices that the cells of the colony begin to swell so that they push each other apart, the colony becoming



three or more times as large as normal (FIG. 4). As swelling increases the activity of the colony decreases and finally ceases. If fresh water is added the colony takes on renewed activity, but usually only for a short time before the cells break apart and swim about independently and quite actively. If drying is allowed to continue, or if the water in which the colonies occur is kept in closed containers, the colonies invariably enlarge greatly and then the cells burst, there being left the most inconspicuous trace of fine particles and no sign of any cell wall. Just before this bursting occurs the cells become badly distorted and irregular.

All attempts to preserve specimens of this alga failed. The invariable result of contact with the many preservatives used was complete disintegration of the colonies and bursting of the cells.

While examining the material from this pool, the writer's attention was drawn to another alga which was present in considerable numbers. This was *Actidesmium Hookeri* Reinsch, another infrequently encountered green alga. This alga is considered by algologists to be a member of the Characiaceae, a family of the order Chlorococcales of the Chlorophyceae. In this country one species has been recorded from California by Smith (3). This species has been reported several times in Europe, where a second species, *Actidesmium globosum*, has also been found.

In the present collection, specimens of *Actidesmium* are quite numerous, occurring among various filamentous algae. The colonies vary considerably in size and in the number of cells, which ranges from small specimens containing only two groups of four and five cells each, to large colonies composed of twenty or more groups, each containing five to eight (or more) cells. (FIG. 5-7).

The cells vary greatly in size and shape. In the majority of the specimens examined, the cells are spindle-shaped objects 17-20  $\mu$  long and 4-10  $\mu$  in diameter, long, acute, pointed at the attached end and bluntly rounded at the free end. In other specimens the cells are more nearly globose and 12-15  $\mu$  in diameter. Several cases were observed in which early stages of zoospore formation existed (FIG. 6).

In view of the apparent rarity of the algae herein mentioned it seems worthwhile to note their occurrence in this locality. It may be that they are of more common occurrence than is supposed, but are not found because examination of the material collected is postponed until too late to observe them.



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## DESCRIPTION OF FIGURES

FIGURES 1–4. *CYCLONEXIS ANNULARIS* Stokes. 1 a, b. Vertical and lateral aspects of normal colony, 2 a–e; fragments of colonies which have been repeatedly “attacked” by small animals. 3 a, b. Reduced colonies re-forming after a normal colony has been broken by encounters with animals. 4. A small colony in which the cells are enlarging as drying occurs.

FIGURES 5–7. *ACTIDESMIUM HOOKERI* Reinsch.

FIGURES 1, 5, 6, & 7 are drawn to scale a; 2, 3, 4 to scale b.

A STATION FOR *CHEILANTHES ALABAMENSIS* IN GILES COUNTY, VIRGINIA.—On July 8, 1938, while collecting with my class from the Mountain Lake Biological Station along the New River, in Giles County, Virginia, I came upon several plants of the Smooth Lipfern, *Cheilanthes alabamensis* (Buckley) Kunze.

The range of this species is usually given as Virginia and Missouri to Alabama, Arizona and Mexico. Its occurrence in Virginia has been based solely upon collections made many years ago in Lee County, where it is said not to have been found recently. Some doubt has been expressed as to whether the plant still exists at this locality. Dr. E. T. Wherry tells me that during the summer of 1938 he spent an entire day in a diligent but fruitless attempt to relocate it on the cliffs of the Powell River in Lee County, where it is believed that the original Virginia specimens were collected. If *Cheilanthes alabamensis* no longer grows in Lee County then the locality here reported may well be the only one now known within the state. At least, it represents a range extension to the east-northeast of about 140 miles.

The present find was made on the calcareous bluffs along the east bank of the New River, about a mile and a quarter north of the town of Ripplemead or one-half mile northwest of the railroad station at Klotz. Here, high up near the crest of the cliffs overlooking the river